G-DEC® Jr

(This is the model name for warranty claims)

p/n 2351000000 (120V)

SERVICE MANUAL



ATTENTION:

WARRANTY SERVICE PROCEDURES

Domestic (U.S. & Canada Only)**:** The G-DEC® Jr Amplifier is not available for warranty field service. Any Dealer/Service Center in possession of a G-DEC® Jr with a warrantable defect should contact the Fender Customer Service Support Center toll free at (866) 345-3642 or email service@fender.com to arrange for a replacement. ***This manual should only be referred to for non-warranty repairs.***

Non-Domestic: FMIC acknowledges that many of our International Distributors are able to perform field or in-house warranty service on the G-DEC® Jr Amplifier.

Fender Musical Instruments Corporation, 8860 East Chaparral Road Suite 100 Scottsdale, AZ 85250
Issued: February, 2007

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(This is the model name for warranty claims)

February, 2007

IMPORTANT NOTICE

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- Parts marked with two asterisks (**) indicate the required use of that specific part. This is necessary for RELIABILITY and SAFETY requirements. **DO NOT USE A SUBSTITUTE!**

PARTS LIST CODES

The description codes used in the itemized Parts Lists are defined below:

CAPACITOR CODES

CAP AE	=	Aluminum Electrolytic
CAP CA	=	Ceramic Axial
CAP CD	=	Ceramic Disk
CAP CR	=	Ceramic Radial
CAP MPF	=	Metalized Polyester Film
CAP MY	=	Mylar
CAP PFF	=	Polyester Film/Foil

RESISTOR CODES

RES CC	=	Carbon Comp
RES CF	=	Carbon Film
RES FP	=	Flame Proof
RES MF	=	Metal Film
RES MOX	=	Metal Oxide
RES WW	=	Wire Wound

HARDWARE CODES

BLX	=	Black Oxide
CR	=	Chrome Plated
HWH	=	Hex Washer Head
M	=	Machine Screw
NI	=	Nickel Plated
OHP	=	Oval Head Phillips
PB	=	Particle Board
PHP	=	Pan Head Phillips
PHPS	=	Pan Head Phillips Sems
SMA	=	Sheet Metal "A" Point
SMB	=	Sheet Metal "B" Point
SS	=	Stainless Steel
TF	=	Thread Forming
ZI	=	Zinc Plated

SPECIFICATIONS

Model Name:		**G-DEC® Jr**
Release Number:		PR 718
Part Numbers	**(120V, 60Hz) US:**	2351000000
	(120V, 60Hz) US DS:	2351000900
	(240V, 50Hz) AUS DS:	2351030900
	(230V, 50Hz) UK DS:	2351040900
	(230V, 50Hz) EUR DS:	2351060900
	(100V, 50/60Hz) JPN DS:	2351070900
	(110V, 60Hz) TW DS:	2351010900
	(220V, 50Hz) ARG DS:	2351050900
	(220V, 60Hz) ROK DS:	2351090900
Power Requirement:		50W
Fuses:		T 600 mA, 250V for 100V versions
		T 500 mA, 250V for 120V versions
		T 250 mA, 250V for 220-240V versions
Input Sensitivity:		30 mV (volume at maximum for full power, tone centered
Power Output:		15W RMS into 8 ohms @ < 5%THD, 100Hz
Impedances	**Input (Front/Rear):**	> 1M Ohm
	Aux In L/R:	100 k Ohm
Speaker Complement:		8”, 8 ohm, special design (P/N 0072797000)
Dimensions	**Height:**	12.5 in (32 cm)
	Width:	13.25 in (34 cm)
	Depth:	7.25 in (19 cm)
Weight:		15 lbs (6.8 kg)

Product specifications are subject to change without notice

SERVICE NOTES

1. **CHASSIS REMOVAL** is accomplished by first removing the eight (8) screws from the cabinet back panel. The cabinet back may be removed by gently prying it out using a flat screwdriver. Next remove the two (2) screws from the rear top of the cabinet into the chassis. Last remove the two (2) handle screws at the cabinet top that secure the chassis. Disconnect the speaker wires form the speaker and gently slide the chassis out from the rear.

2. **MAIN PCB REMOVAL** is accomplished by first removing the eleven (11) wires at the Faston® connectors. There are two wires at P9/P10 (BRN). A set of three (3) wires at P6/P7 (RED) and P5 (YEL). A set of four (4) mains wires at P3/P4 (BLK) and P1/P2 (WHT). One (1) ground wire (GRN) at P5. Remove the two (2) Phillips head screws that mount the small rear panel MIDI/AUX/HEADPHONE PCB to the panel. Remove all nine (9) knobs. Note the four (4) knobs on the AMP SELECT, FX SELECT, KEY SELECT and LOOP SELECT encoders are different than the five (5) knobs on the potentiometers. Keep them separated. Remove the panel nut on the INPUT JACK. Pull the small INPUT PCB down and out of the chassis hole. Remove the nine (9) panels nuts and nine (9) flat washers on all the controls. Remove the two (2) screws that attach the heat sink to the chassis. Remove the five (5) screws and five (5) lock washers that attach the PCB to the chassis standoffs. With the chassis facing up drop the PCB down until the control shafts clear the chassis and the slide it back and out from the chassis. Note that there are two (2) flat washers on each of the 4 encoders shafts mentioned above, so do not lose them. To remove the heat sink, remove the two (2) sets of screws, shoulder washers, insulating pads, flat washers and nuts that secure U3 and U5 to the heat sink. Last remove the one (1) screw and one (1) lock washer that holds the heat sink to the PCB.

PCB EXCHANGE POLICY

Parts marked with a single asterisk (*) in the Part Lists are not field replaceable. If a failure due to one of these components is detected, please contact the FMIC Customer Service Department to order the complete PCB Assembly.

CIRCUIT DESCRIPTION

This section provides concise information about new or unusual circuitry designs incorporated into this amplifier model. The purpose is to aid the service technician by providing insight into the design areas most likely to become obstacles in troubleshooting. Information is focused for its effective use while maintaining the security of Fender® proprietary information wherever possible.

MAIN PCB - ANALOG INPUTS/OUTPUTS

Op-amp U8-B provides the high impedance instrument input with 15db of gain. Op-amp U8-A is a configured as a three pole active filter. The filtered output signal (Lin) drives the encoder portion of the CODEC U13 of the uDSP processing section of the amplifier. Signal VQ2 is the D.C. reference voltage from the CODEC thus centering the output signal about this level. Op-amp U2-B is configured as a differential input amp recovering the signal after uDSP processing and conversion back to an analog signal in the decoder portion of the CODEC U13. The LOUT+ and LOUT- signals are the input to the differential amp which acts as a three pole active low pass filter. The output of U2-B is applied to a unity gain buffer amp U2-A which drives op-amp U1-A. U1-A is a unity gain buffer when no headphone is connected and in turn drives the power Amp I.C. U3 via R36. FET Q1 provides system muting during power up/down in conjunction with the power sense circuits comprised of D10, Q2, Q4.

MAIN PCB – POWER/HEADPHONE AMPLIFIER

U3 is a 15 Watt monolithic power amp device which drives the 8 ohm speaker. Fender conventional current feedback is applied to the power amplifier via current sense resistor pair R24/R26 and the voltage feedback to the amp via R28/R30. Current feedback affects the power amplifier output resistance so it reacts with the speaker load similar to a tube amplifier. The main internal speaker (8ohms minimum load) is connected at P3/4. The internal speaker is disconnected if a connection is made to the Headphone Jack J2.

Op-Amp U1-A and U1-B act as the headphone amplifier when a headphone is plugged into J2. The gain of U1-A goes from unity to 21 dB when a headphone is plugged in. U1-A drives the left side of the headphones and U1-B drives the right side of the headphones.

uDSP System

The uDSP system is integrated on the main PCB of the G-DEC Jr. The UDSP system is comprised of the microprocessor U10 (TMS320VC5501) and associated memory (static RAM U14 and flash ROM U11). Signals to and from the uDSP chip are in serial digital format. Signal input is from the encoder portion of the CODEC U13 and output to the decoder portion of the CODEC U13. The CODEC converts the analog input signal to digital format for processing. The processed output digital signal and it is then converted back to analog format and sent to the power amplifier.

All analog controls; LOOP Start/Stop switch; and headphone present status are read via the analog multiplexer U6-A. The output of the multiplexer is read serially by the right channel of the CODEC and sent to the uDSP system

Note: Troubleshooting the uDSP system to component level beyond verification of power supplies, clock, and data signals is NOT recommended.

MIDI System

MIDI Input signals from the external MIDI INPUT Jack (J4) are optically isolated via U22 and sent to the Rx line of the uDSP UART controller within U10 for processing. When MIDI is selected on the LOOP Selector, the MIDI signal being received is passed through to the Tx line of the uDSP UART and to the MIDI IN of the SAM2195 Dream Synthesizer chip U20. The SAMP2195 then plays MIDI sounds based on the commands being sent from the external MIDI sequence source.

With internal LOOPS selected the external MIDI input is ignored and MIDI IN signals are generated by the uDSP system under control of the LOOP SELECT and KEY SELECT controls. The rate is controlled by the TEMPO control.

Audio output from the SAM2195 Dream Synthesizer chip is mixed in at summing op-amp U2-B via R50/R54. The audio output of U2-B is mixed in with the instrument post processed (effects and amp types added) and Auxiliary Input audio at U2-A.

POWER SUPPLIES

The power transformer secondary windings are connected to the main PCB at P5 through P10.

The +/-20VDC power supplies for the solid-state power amplifier are derived from the red-yellow-red secondary of the power transformer via full bridge rectifiers D4/D5 and D2/D3, and main filter caps C14 and C8. The yellow center tap lead and the system's chassis connection are placed between these caps, making this the system ground star.

The +/-12VDC power supplies for the op-amps are regulated down from the +/-20 VDC supplies through dropping resistors R13-14 and Zener Diodes D6 and D7.

The +11.5VDC power supplies for the Digital circuitry is derived from the brown-brown secondary of the power transformer via full bridge rectifiers D15, D16, D17 and D21 and filter caps C34. This raw supply is then regulated down to +5VDC by U5 (7805).

The +5VDC supply powers multiplexer U6, Front Panel LED drivers Q5-Q7 and the D.C. reference voltage string R41-R43 for the high-low reference level for front panel potentiometers. The +5V is regulated down to 3.3v and 1.25V via U18 and U17 respectively. The 3.3V and 1.25 V supply power to the uDSP system components and the MIDI I/F components including the SAM2195 Dream Chip U20 and U22 MIDI input opto-isolator. Reset controller U12 monitors the +5V supply and shuts down all ICs in the event of power loss.

USER INTERFACE

The 4 - 16 position encoders (S2 –S5) for the LOOP, AMP, KEY and EFFECT SELECT are read via the port expander U9 and the data sent to the uDSP system via the I^2C interface lines SCL and SDA.

The 4 potentiometers VOLUME(R51), GAIN(R49), TONE(R44), and TEMPO(R31) generate DC voltages (+1.0V to +4.0V) that are read by the analog multiplexer U6. IO0-IO3 are the digital control lines used to multiplex these analog signals which are sent serially to the system CODEC U13 on the Rin channel. The LOOP START/STOP button and the state of the HEADPHONE present signal are read in a similar manner. The uDSP system reads the state of these controls and inputs digitally from the CODEC.

The LOOP VOLUME is a conventional analog control which accepts the MIDI left and right loop audio signals from the SAM2195 MIDI Synthesizer via the mixer op-amp U7-B.

G-DEC® Jr

(This is the model name for warranty claims)

.PARTS LIST: MAIN – PCB ASSEMBLY			
QTY.	**PART #**	**DESCRIPTION**	**REFERENCE DESIGNATION**
1	REF	*PCB ASSY G-DEC® Jr MAIN	COMPLETE PCB ASSY
FIELD SERVICE ON THIS ASSY. LIMITED TO THE PART NUMBERS LISTED BELOW			
5	REF	WASHER TOOTHED AW-3	PCB MOUNTING
2	0072781000	JACK DIN PIN	J4 MIDI IN
5	REF	CONTROL 10kB	R3,R31,R38,R44,R49,R51
4	0055983000	ENCODER 16PS 4BITGRY RTRY	S2-S5
1	0041812000	IC REGULATOR +5V MC7805CT	U5
1	0051934000	IC POWER AMP TDA2050V 32W	U3
1	REF	*HEAT SINK G-DEC® Jr	@ U3, U5
2	REF	SCREW M3X10 BLK B/H	@ U3, U5
2	REF	WASHER FLAT M3	@ U3, U5
2	REF	NUT M3 NIP	@ U3, U5
2	REF	WASHER SPLIT LOCK M3	@ U3, U5
2	REF	BUSHING PATR-2935	@ U3, U5
2	REF	SILICONE PAD TO-220	@ U3, U5
4	0051658000	JACK MONO 1/4"	J3 INPUT
2	0072780000	JACK 3.5 mm STEREO W/SWITCH	J1, J2 AUX INPUT, HEADPHONE OUTPUT

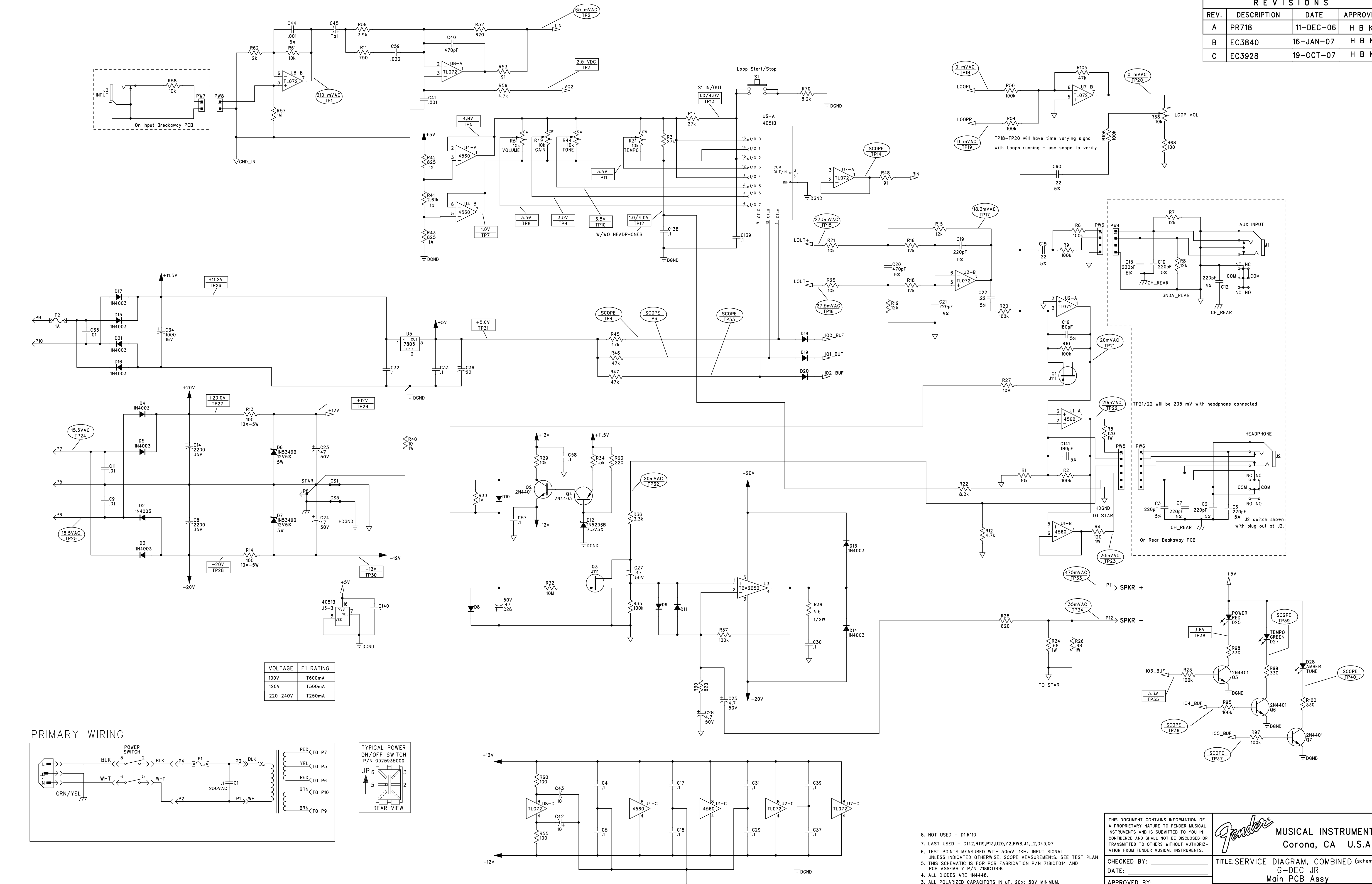
PARTS LIST: CHASSIS ASSEMBLY			
QTY.	**PART #**	**DESCRIPTION**	**REFERENCE DESIGNATION**
1	REF	CHASSIS G-DEC Jr	
1	REF	*PCB ASSY G-DEC Jr MAIN	COMPLETE PCB ASSY
1	REF	**XFMR G-DEC® Jr 120V	
-	REF	**XFMR G-DEC® Jr 230V	
-	REF	**XFMR G-DEC® Jr 100V	
1	0039287000	POWER SWITCH SNAP IN	
1	REF	TRANSFORMER GASKET	@ TRANSFORMER BASE
4	006470600	KNOB ROTARY G-DEC® Jr	@ POTS (with flat washer and nut)
5	REF	KNOB ENCODER G-DEC® Jr	FX, KEY, AMP, LOOP (with flat washer and nut)
1	0048451000	PUSH BUTTON IVORY	LOOP START/STOP
8	REF	WASHER DIA 9 CRP	2EA @ INSIDE OF ENCODER SHAFTS
1	0072791000	**IEC INLET	AC INLET
-	0048381000	**FUSE T600mA 5X20MM	100V UNITS ONLY Littelfuse 218P.600
1	0003111000	**FUSE T500mA 5X20MM	120V UNITS ONLY Littelfuse 218P.500
-	REF	**FUSE T250mA 5X20MM	230-240V UNITS ONLY Littelfuse 218P.250
5	REF	M3X5 ZNP B/H	@ PCB
5	REF	AW-3	@ PCB
3	REF	FLANGE NUT M) 4 ZNP	@ XFMR, GND
2	REF	TF 6-32X6 BLK B/H	@ REAR I/O PCB
2	REF	T 2.1X8 BLK R/H	@ MIDI JACK
3	REF	TF 4-40X6 ZNP B/H	@ HEAT SINK

*	Non-serviceable part. Replace complete parent assembly. See PCB EXCHANGE POLICY section above.
shaded	Unique Fender® part. Order directly from the FMIC Parts Department.
shaded + *	Access to this part or assembly is controlled. Please contact the FMIC Customer Service Department.
**	Safety Requirement part. Replacement must match Safety Agency…–*Value,* if specified –*Type,* if specified –*Approval Mark(s)* if on part.
shaded + **	Both a unique Fender® part and a Safety Requirement part as defined above.

PARTS LIST:		END ITEM ASSEMBLY	
QTY.	PART #	DESCRIPTION	REFERENCE DESIGNATION
1	REF	*CABINET ASSY G-DEC® Jr	
5	REF	SCREW M) 4X30 BLK T/H	@ CABINET BACK
1	REF	SPEAKER 8" 8 OHM G-DEC® Jr	
4	REF	NUT FLANGE M) 4 ZNP	@ SPEAKER
1	0047248000	**CORD PWR W/IEC CONN DOM	120V ONLY
-	0047249000	**CORD PWR W/IEC CONN 230V UK	230V UK ONLY
-	0047250000	**CORD PWR W/IEC CONN 240V	240V AUS ONLY
-	0047251000	**CORD PWR W/IEC CONN 230V	230V EUR ONLY
	0057674000	**CORD PWR W/IEC CONN 230V ARG	230V ARG ONLY
-	0053997000	**CORD PWR W/IEC CONN 100V JPN	100V JPN ONLY
1	0072802000	*BADGE G-DEC®	
2	REF	SCREW T) 2.1X10 NIP R/H	@ BADGE
1	0051043000	*NAMEPLATE FENDER GENERIC	
4	0036500000	ESCUTCEHON PINS	@ NAMEPLATE
1	REF	MANUAL OWNERS G-DEC® Jr	
5	REF	SCREW NO. 8 U32X30 BLK O/H	@ CHASSIS TOP AND REAR
3	REF	SCREW M 3.5X10 BLK T/H	@ CHASSIS REAR
4	REF	WASHER BLK FINISHING TYPE	@ CHASSIS
1	0037121000	HANDLE RIBBED 9 1/4"	
2	0032524000	HANDLE STRAP METAL INSERT	
2	0025395000	HANDLE CAPS - NICKEL	
2	REF	M)4X32 NIP O/H	@HANDLE
4	REF	FOOT RUBBER 18X10	
4	REF	T)2.1X8 BLK R/H	@ FEET

*	Non-serviceable part. Replace complete parent assembly. See PCB EXCHANGE POLICY section above.
shaded	Unique Fender® part. Order directly from the FMIC Parts Department.
shaded + *	Access to this part or assembly is controlled. Please contact the FMIC Customer Service Department.
**	Safety Requirement part. Replacement must match Safety Agency…–*Value,* if specified –*Type,* if specified –*Approval Mark(s)* if on part.
shaded + **	Both a unique Fender® part and a Safety Requirement part as defined above.

Service Diagram List



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PR718	11-DEC-06	H B K
B	EC3840	16-JAN-07	H B K
C	EC3928	19-OCT-07	H B K

VOLTAGE	F1 RATING
100V	T600mA
120V	T500mA
220-240V	T250mA

PRIMARY WIRING

TYPICAL POWER ON/OFF SWITCH P/N 0025935000

REAR VIEW

8. NOT USED – D1,R110
7. LAST USED – C142,R119,P13,U20,Y2,PW8,J4,L2,Q43,Q7
6. TEST POINTS MEASURED WITH 50mV, 1KHz INPUT SIGNAL UNLESS INDICATED OTHERWISE. SCOPE MEASUREMENTS: SEE TEST PLAN
5. THIS SCHEMATIC IS FOR PCB FABRICATION P/N 718ICT014 AND PCB ASSEMBLY P/N 718ICT008
4. ALL DIODES ARE 1N4448.
3. ALL POLARIZED CAPACITORS IN uF, 20%; 50V MINIMUM.
2. ALL UNPOLARIZED CAPACITORS IN uF, 10% OR BETTER; 50V MINIMUM. (POWER SUPPLY BYPASS CAPACITORS ARE 20%).
1. ALL RESISTORS IN OHMS, 5%; 1/4W.

NOTES: (UNLESS OTHERWISE NOTED)

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CHECKED BY:

DATE:

APPROVED BY:

DATE:

DRAWN: H. KAPLAN | ENGR: H. KAPLAN

DATABASE FILE: Z718S1.SCH

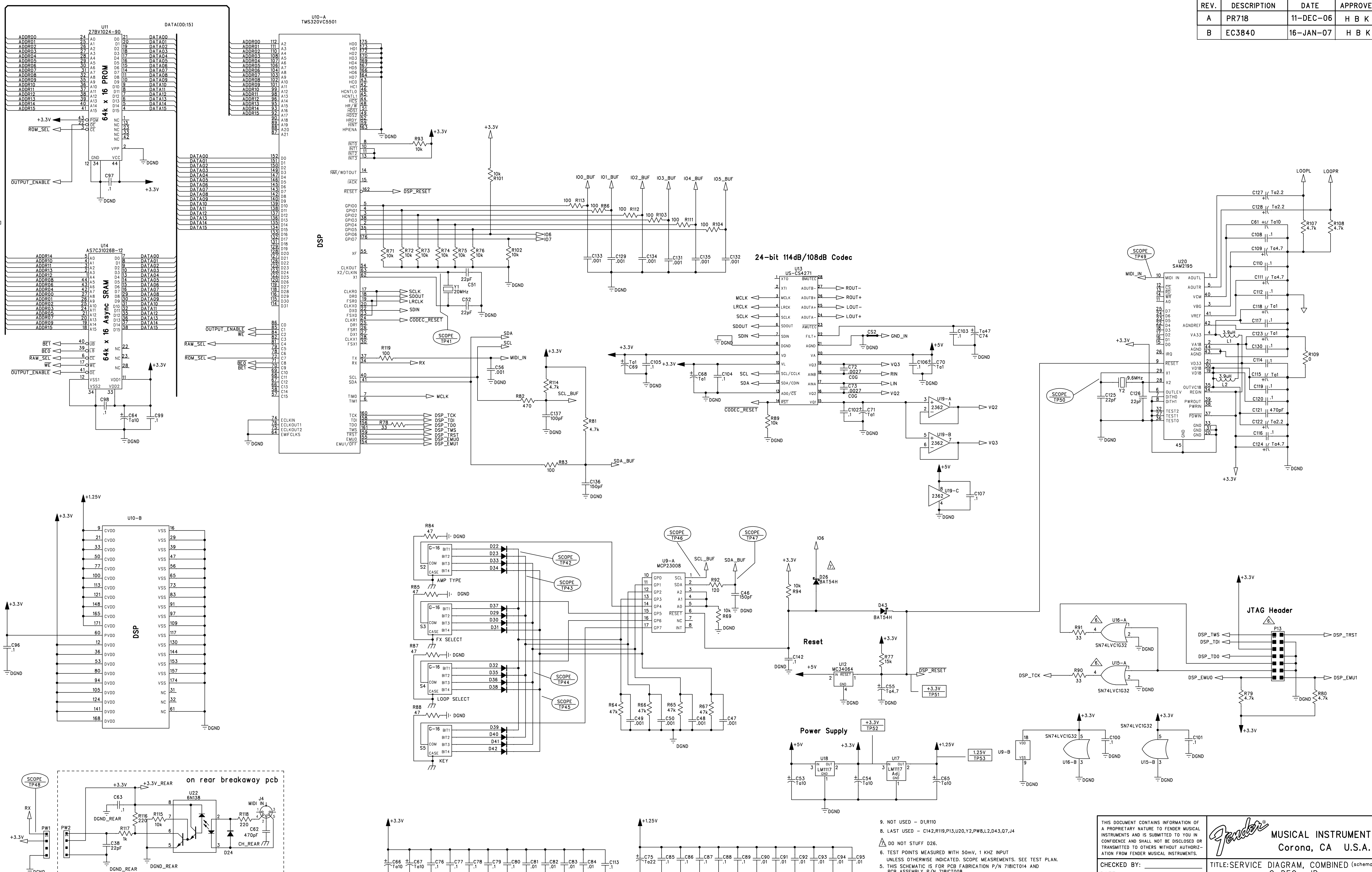
Fender MUSICAL INSTRUMENTS
Corona, CA U.S.A.

TITLE: SERVICE DIAGRAM, COMBINED (schematic)
G-DEC JR
Main PCB Assy

SIZE: D | DRAWING NUMBER: 718ICT013 | REV.: C

RELEASE DATE: 11-DEC-06 | SHEET: 1 OF 3

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PR718	11-DEC-06	H B K
B	EC3840	16-JAN-07	H B K



NOTES: (UNLESS OTHERWISE NOTED)

1. ALL RESISTORS IN OHMS, 5%; 1/10W.
2. ALL UNPOLARIZED CAPACITORS IN uF, 10% OR BETTER; 50V MINIMUM. (POWER SUPPLY BYPASS CAPACITORS ARE 20%).
3. ALL POLARIZED CAPACITORS IN uF, 20%; 50V MINIMUM
4. ALL DIODES ARE 1N4448.
5. THIS SCHEMATIC IS FOR PCB FABRICATION P/N 718ICT014 AND PCB ASSEMBLY P/N 718ICT008
6. TEST POINTS MEASURED WITH 50mV, 1 KHZ INPUT UNLESS OTHERWISE INDICATED. SCOPE MEASUREMENTS, SEE TEST PLAN.
7. DO NOT STUFF D26.
8. LAST USED - C142,R119,P13,U20,Y2,PW8,L2,D43,Q7,J4
9. NOT USED - D1,R110

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Fender MUSICAL INSTRUMENTS Corona, CA U.S.A.

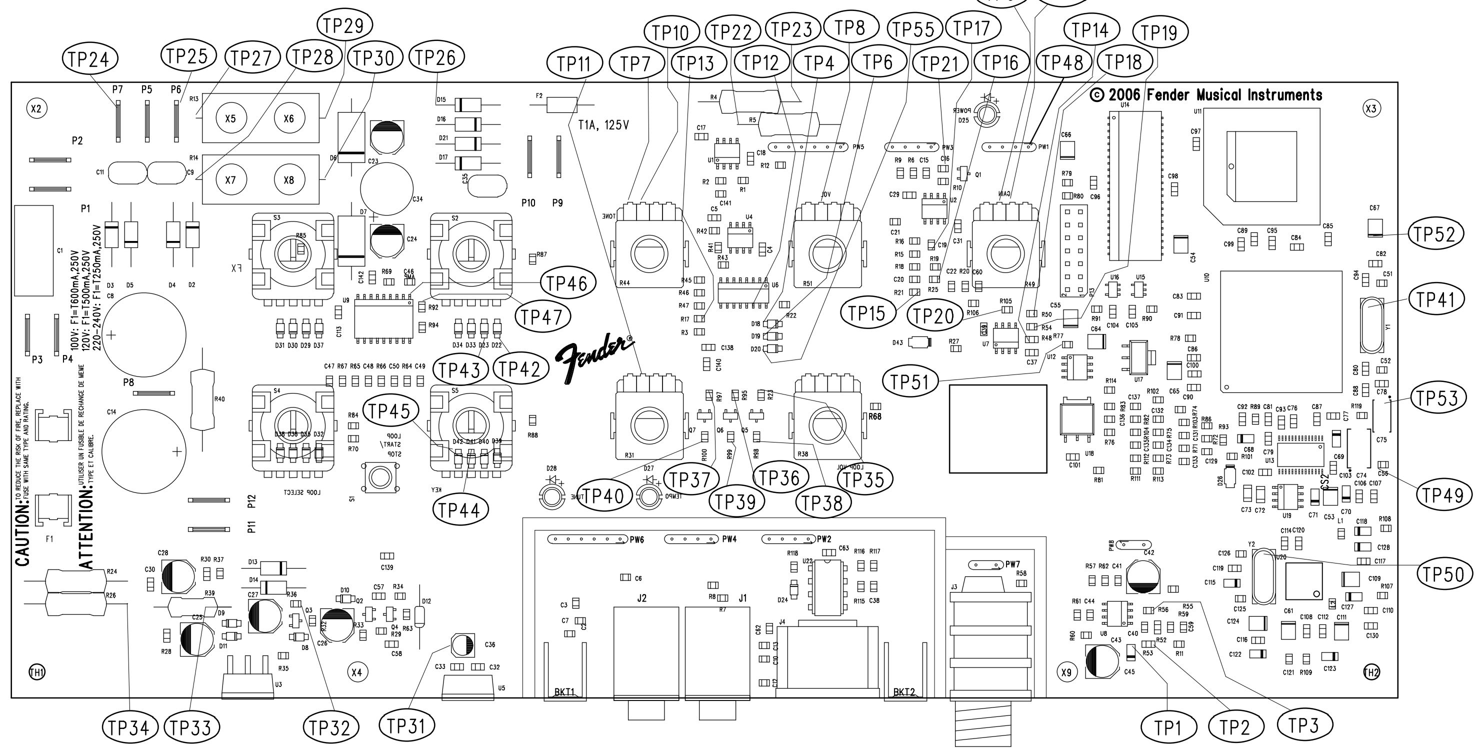
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CHECKED BY: ____
DATE: ____
APPROVED BY: ____
DATE: ____
DRAWN: H. KAPLAN | ENGR: H. KAPLAN
DATABASE FILE: Z718S2.SCH

SIZE D | DRAWING NUMBER 718ICT013 | REV. B

RELEASE DATE: 11-DEC-06 |

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PR718	11-DEC-06	H B K
B	EC3280	16-JAN-07	H B K
C	EC3928	19-OCT-07	H B K



FILM/DWG:	SERVICE DIAGRAM
DATABASE: Z718P.PCB	DATE: 19-OCT-07

NOTES: (UNLESS OTHERWISE NOTED)

1. SEE SHEET 1 FOR TEST POINT VALUES AND FUNCTIONS.

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Fender MUSICAL INSTRUMENTS
Corona, CA U.S.A.

CHECKED BY:	TITLE: SERVICE DIAGRAM, COMBINED (PCB assy) G-DEC JR Main PCB Assy
DATE:	
APPROVED BY:	SIZE: C
DATE:	DRAWING NUMBER: 718ICT013
DRAWN: H. Kaplan / ENGR: H. Kaplan	REV.: C
DATABASE FILE: Z718P.PCB	RELEASE DATE: 05-DEC-06 / SHEET 3 OF 3